STATEMENT OF BASIS FOR
THE SELECTION OF
CORRECTIVE MEASURES FOR THE
RIVER RECYCLING INDUSTRIES FACILITY
CLEVELAND, OHIO
OHD 004 187 035

ACRONYMS AND ABBREVIATIONS

CAG	Community Advisory Group
CFR	*Code of Federal Regulations*
CMS	Corrective Measures Study
COC	Constituent of Concern
COPC	Constituent of Potential Concern
ERA	Ecological Risk Assessment
ESL	Ecological Screening Levels
HI	Hazard Index
HHRA	Human Health Risk Assessment
IMZM	Inside Mixing Zone Maximum
OAC	Ohio Administrative Code
OEPA	Ohio Environmental Protection Agency
ODNR	Ohio Department of Natural Resources
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SOB	Statement of Basis
SWMU	Solid Waste Management Unit
U.S. EPA	United States Environmental Protection Agency
USD	Urban Setting Designation
UST	Underground Storage Tank
VCA	Voluntary Corrective Action

STATEMENT OF BASIS FOR THE SELECTION OF CORRECTIVE MEASURES FOR THE RIVER RECYCLING INDUSTRIES FACILITY CLEVELAND, OHIO

1.0 INTRODUCTION

This Statement of Basis (SOB) for the River Recycling Industries (RRI) facility in Cleveland, Ohio, is being issued by the United States Environmental Protection Agency (U.S. EPA) to fulfill part of its public participation responsibilities under the Resource Conservation and Recovery Act (RCRA). The SOB explains the proposed remedy for addressing any contaminated soil, surface water, sediment, or groundwater at the facility. The SOB also explains the reasons for selecting the remedy and summarizes any other remedies evaluated. The U.S. EPA will select a final remedy for the facility after the public comment period has ended and any information submitted has been reviewed and considered.

This SOB summarizes more detailed information that can be found in the RCRA Facility Investigation (RFI) Report, entitled Voluntary Corrective Action for SWMUs 9 and 11 (April 2002), and in the other documents in the administrative record for the facility. The U.S. EPA encourages the public to review these documents in order to gain a more comprehensive understanding of the facility and the RFI that has been conducted there.

The U.S. EPA may modify the proposed remedy or select another remedy based on new information or public comments. The public is encouraged to become involved in the remedy selection process by reviewing the documents in the administrative record. The administrative record for the Voluntary Corrective Action (VCA) Agreement and remedy selection is on file at the Cleveland Public Library, Brooklyn Branch, 3706 Pearl Road, Cleveland, Ohio. The materials may also be viewed at the U.S. EPA, Waste, Pesticides and Toxics Division, 7th floor, 77 West Jackson Boulevard, Chicago, Illinois.

2.0 PROPOSED REMEDY

The proposed remedy for the RRI facility includes corrective measures to minimize or eliminate the risk of Constituents of Concern (COCs) to ecological receptors; aesthetic enhancements to the Cuyahoga riverbank area; and institutional controls. Specific remedies for the individual Solid Waste Management Units (SWMU) at the facility are summarized in Table 1.

TABLE 1
PROPOSED REMEDY FOR RIVER RECYCLING INDUSTRIES FACILITY

Remedy Component	Applicable SWMU
Install ecological cover consisting of a geotextile and a half meter of clean topsoil over the top of the bank area.	SWMU #11: Former wastewater lagoons and top of the riverbank area.
Construct a half meter-tall berm of packed clay along the top of the riverbank.	SWMU #11: Former wastewater lagoons and top of the riverbank area.
Establish areas of native plants over the top of the bank area and plant the remainder of the SWMU with turf grasses to be maintained as a lawn.	SWMU #11: Former wastewater lagoons and top of the riverbank area.
Implement institutional controls to restrict land use to industrial purposes	Entire facility

3.0 FACILITY BACKGROUND

This section discusses the environmental setting; geology and hydrogeology; operational history; and RFI for the RRI facility.

Environmental Setting

The RRI facility lies within a portion of the former floodplain of the Cuyahoga River that is bounded to the northwest, north, and east, by an oxbow meander of the Cuyahoga River. This area is locally referred to as the "Bradley Peninsula". The "peninsula" has been filled since development of the area (late 1800's). The RRI facility occupies the southeastern half of the peninsula, and the Alumitech property occupies the west-northwestern half. The central portion of the RRI facility is largely paved outside the footprints of the facility building and ancillary structures. The facility perimeter/riverbank area is vegetated with trees and brush. The neighboring property (Alumitech) is developed in a similar fashion, and includes a large stockpile of aluminum dross skimmings. Alumitech refines the dross skimmings to recover aluminum. The dross skimmings are a by-product of aluminum refining that are comprised largely of sodium and potassium chloride, aluminum, and other metals caught in the matrix during the refining process.

Local topography is generally flat, with an average elevation of approximately 590 feet above mean sea level (amsl), and gradually slopes from south to north, toward the Cuyahoga River. Beyond the

property, the valley walls rise relatively steeply to upland areas with an average elevation of approximately 700 feet. Figures 1 and 2 show the property location map, and facility layout, respectively.

The surrounding properties within the valley floor are used for industrial purposes. The closest residential areas lie above the valley floor to the South in the Valley uplands, and are approximately 1000 feet from the Facility. The nearest schools, Franklin Elementary School and Denison Elementary School are located about one mile southwest and northwest, respectively from the Facility.

Geology and Hydrogeology

The Property is located in an area of Cuyahoga County just west of the edge of the Allegheny Plateau in the Eastern Lake and Till Plains sections of the Central Lowland Province. Unconsolidated glacial, alluvial, and lacustrine deposits consist of silt, sand, gravel, and silty clay. Bedrock below the glacial deposits in the county is sandstone and shale. Lower bedrock formations include shale, limestone, dolomite, halite and anhydrite.

Groundwater is not used for potable purposes in the Cleveland area. Drinking water is obtained from Lake Erie from a series of offshore intakes, each located at least three miles from the Property. The nearest residential well on record with the Ohio Department of Natural Resources (ODNR) is located more than three miles from the Property. Groundwater at the Facility is also the subject of an Urban Setting Designation ("USD") by the Director of the Ohio Environmental Protection Agency (OEPA) (see Ohio Administrative Code (OAC) 3745-300-100)). The USD is a formal confirmation by the Director of OEPA that groundwater is and will not be used as a drinking water source. The nearest wells on file with the ODNR are located about three to six miles southeast of the Facility.

Operational History

The facility was originally developed in the later half of the 1800s as a copper refinery and then converted to a brickworks. RRI purchased the facility in 1919 and currently acts as an intermediate dealer of copper alloys. Scrap metals from the plumbing, marine, bearings, electric, automotive, and locomotive industries, as well as from scrap dealers provide the raw materials for the operation. The materials are combined, melted, and formed into ingots, which are shipped to customers as final products. The slag from the smelting operations is sold to other smelters for further refining. RRI also manufactures resin coated sand used to make industrial cores and molds for the metal castings industries.

RCRA Facility Investigation

In accordance with the Voluntary Corrective Action Agreement (VCA) between the U.S. EPA and RRI, effective September 30, 2000, RRI conducted an RFI and Corrective Measures Study (CMS) to characterize the nature, extent, and migration rate of potential constituents of potential concern (COPC) at the facility; and then evaluated the need for and design of any final corrective measures. The RFI focused on 2 SWMUs, identified as #9 and #11. SWMU #9 is a former waste oil underground storage tank (UST) that was used to store fuel for smelting furnaces. SWMU #11 consists of two former lagoons that were used to accumulate wastewater from a closed wet scrubber and Mill and water sorting operation. Specific decision statements for the RFI included; (1) Have hazardous constituents been released from the SWMUs that present an unacceptable human or ecological risk?, (2) What measures, if any, are necessary to control any unacceptable risks?, and (3) What measures, if any, are necessary to control the migration of contaminated groundwater?

Following soil and groundwater sampling, decision rules for the site were designed to determine if site-related chemicals (potentially originating from SWMU #9 and SWMU #11) were present at levels that may impact human health and the environment. The detected concentrations of each chemical in surface and total soil were compared to appropriate human health and ecological screening criteria. All detected chemicals exceeded the U.S. EPA Region 5 (1999) Ecological Screening Levels (ESL). This is not surprising since the entire Bradley Peninsula consists of non-native fill material. Therefore, it was determined that the ESL evaluation alone was not a definitive determination for identifying chemicals in soil originating from the Property. Chemicals in on-site soils identified as chemicals of concern (COCs) for further risk evaluation included: arsenic and lead (surface soil 0-2 feet); and arsenic, lead, and zinc (subsurface soil >2 feet). Chemicals in groundwater identified as COCs for further evaluation in the groundwater fate and transport model for the protection of human health and aquatic life included: aluminum, arsenic, copper, lead, mercury, vanadium, and zinc.

4.0 SUMMARY OF FACILITY RISKS

The data collected in the RFI was compared to human health risk-based action levels and was used in a Human Health Risk Assessment (HHRA) and an Ecological Risk Assessment (ERA) to help determine the risks posed by COPCs. The HHRA and ERA process included (1) identifying COPCs, (2) assessing the types of exposures that may occur based on current and potential future land uses, and (3) determining the risks posed to humans or ecological receptors exposed to COPCs. The U.S. EPA expects that future land use will be consistent with the current industrial land use. The proposed remedy presented in Table 1 addresses all SWMUs that were found to pose an unacceptable risk to human health and the environment. Table 2 summarizes the constituents which exceeded U.S. EPA screening levels for human or ecological health and were therefore included for further evaluation.

TABLE 2
COCs Identified for Further Evaluation

Receptor	Surface Soil	Subsurface Soil	Groundwater
Human Health	Arsenic and Lead	Arsenic, Lead, and Zinc	Aluminum, Arsenic, Lead, and Mercury
Ecological	Metals		Copper, Lead, Vanadium and Zinc
Cuyahoga River			Metals, Anthracene and Chrysene

Site Conceptual Model and Human Health Risks

The elements necessary to construct a complete exposure pathway and develop the conceptual model include:

1. Source Area and COCs;
2. Transport mechanisms;
3. Exposure routes; and
4. Receptors.

An exposure pathway describes the mechanism by which an individual is exposed to COCs in, or originating from, a source area. In order for an exposure pathway to be complete there must be a chemical source/release, a point of contact by a receptor with the environmental medium, and an exposure route by which contact can occur. If the point of exposure is different from the source location, a transport medium is required. All four components must be present for the exposure pathway to be complete. The source and COCs, exposure route, and potential receptors for SWMUs #9 and #11 have been identified and are discussed in the following sections.

Identification of Receptors

Based on the current and anticipated future industrial land use of the Site, potential receptors are limited to current RRI workers in the area of SWMUs #9 and #11 (current industrial workers). Future use of the Property will remain industrial since the entire Property and adjacent properties are zoned for industrial land use. Future use of the Property may include and/or require excavation/construction in the

area of SWMUs, thus future on-site potential receptors include future industrial workers and excavation/construction workers.

Potential Transport Mechanisms and Exposure Routes

The following exposure scenarios were considered potentially complete pathways and were evaluated.

Current and Future Industrial Workers: Based on current and expected industrial conditions at the Property, on-site receptors are limited to industrial workers. Potential exposure routes for on-site industrial workers include dermal contact with, ingestion of and particulate inhalation of surface soils. To be protective of potential current and future industrial workers, the site-specific HHRA assumed that an industrial worker will perform outdoor activities for an estimated 193 days/year. This is based on a normal work schedule 5 days/week for 52 weeks, subtracting out 10 days of vacation time, 11 days of holiday and sick time, 20 working days when frozen or snow-covered conditions preclude outdoor work exposure, and 26 days when heavy rain inhibits outdoor work. This is a conservative estimate since Northern Ohio counties experience 2-3 months with an average monthly temperature of below 32^{o}F. Additionally, Ohio generally has about 20 non-winter days per year with rainfall of 0.5 inches or more of rainfall. Currently, RRI workers are not performing tasks on a regular basis out of doors on-site. Although industrial workers typically do not have duties that involve full-time outdoor activities, as indicated by current operations, some possibility of direct contact with COCs in soils in the area of SWMUs is possible.

Future Excavation/Construction Worker: It is possible that future construction and/or excavation activities may occur in the areas of the SWMUs. When considering future land use, future construction/excavation workers may be exposed to COCs in surface and subsurface soil in the area of the SWMUs via dermal contact with, ingestion of, and particulate inhalation. Therefore, the site-specific HHRA assumed that an excavation/construction worker will spend 60 days of construction activities (8 hour work days) in contact with soils in the area of the SWMUs (dermal contact, ingestion, and inhalation). Exposure factors were selected in keeping with standard U.S. EPA default assumptions.

Exposure Parameters

Doses for each COC were estimated by combining the pertinent exposure factors for a given scenario with the concentration of the COC in question. The maximum detected concentration of each COC detected in surface soil was used in the Site-Specific HHRA for the industrial worker; as was the maximum detected concentration of each COC detected in the total soil column (surface and subsurface soil combined) for the excavation/construction worker. The maximum detected concentration of each COC from on-site soils is used to ensure that the combination of all intake

variables results in an overly conservative estimate of maximum exposure such that the exposure is not underestimated.

Industrial Worker Scenario Risk

The potential for adverse effects to an industrial worker exposed to surface soil COCs in the areas of the SWMUSs via dermal contact, ingestion and particulate inhalation was determined to be acceptable. A Total Hazard Index (HI) value of 0.09 was calculated for the hazard evaluation using the maximum detected concentrations of arsenic and lead in surface soils at the SWMUs . These results are below the target noncancer risk goal of 1 established by the U.S. EPA. Based on this evaluation, noncancer risks for workers performing outdoor duties in the area of SWMUs #9 and #11 are acceptable.

Theoretical carcinogenic health risks are defined in terms of a probability that an individual may develop cancer as a result of exposure to a given chemical at a given concentration and are most often expressed in scientific notation because they are typically very small numbers. For example, a theoretical cancer risk calculated as 5×10^{-5} is the same as 5 in 100,000. This is the incremental probability of developing cancer (i.e., the theoretical excess cancer risk) or the additional risk above the cancer risk an individual would face in the absence of exposures characterized in this assessment. In other words, 5×10^{-5} is interpreted to mean that no more than five additional cancers would occur in 100,000 people similarly exposed over a lifetime (70 years), but the true risk is probably less and maybe as low as zero. These values are compared to arbitrary "acceptable" risk values selected to be sufficiently low as to result in no practical cancer risk to exposed populations if the calculated value falls below it. The theoretical excess cancer risk was determined for each carcinogenic chemical using the total lifetime average daily dose (LADD) from all pathways and cancer slope factors.

The potential cancer risks for an industrial worker performing outdoor tasks in the area of the two SWMUs, occur via dermal contact with, ingestion of, and inhalation of particulates from surface soils containing COCs. An acceptable total risk value of 4×10^{-6} was calculated for the maximum evaluation. This maximum risk estimate is well below the industrial scenario risk goal of 10^{-4} as established by U.S. EPA Region 5.

Excavation/Construction Worker Scenario Risk

The potential for adverse effects to an excavation/construction worker exposed to COCs in surface and subsurface soils in the area of the two SWMUs via dermal contact, incidental ingestion and inhalation of particulates while performing excavation activities in these areas was determined to be acceptable. A Total HI value of 0.2 was calculated for the hazard evaluation using the maximum detected concentrations of arsenic, lead and zinc in surface and subsurface soils combined from

SWMUs #9 and #11. These results are within the range of the target noncancer risk goal of 1 established by U.S. EPA. Based on this evaluation, noncancer risks for an excavation/construction worker performing excavation activities in the area of SWMUs #9 and #11 are acceptable.

The potential cancer risks for an excavation/construction worker performing excavation activities in the area of the two SWMUs occur via dermal contact with, incidental ingestion of, and inhalation of particulates originating from surface and subsurface soils. An acceptable total risk value of 2×10^{-7} was calculated for the maximum evaluation. This maximum risk estimate is well below the target risk goal of 10^{-5} for a commercial/industrial scenario as established by U.S. EPA Region 5.

Bioscreen Modeling Results

RRI conducted a solute transport model (BIOSCREEN) to ensure that the concentration of COCs potentially migrating to the Cuyahoga River were protective of human and ecological health. During model simulations, it was demonstrated that aqueous phase metals from the shallow saturated zone do not reach the Cuyahoga River at levels exceeding the Inside Mixing Zone Maximum (IMZM) concentrations for the protection of aquatic life in the Lake Erie Drainage Basin as designated by the OEPA. In fact, a 100-year simulation suggested that aqueous phase metals have very limited mobility in the shallow saturated zone. Moreover, the model output shows that, even with very conservative input parameters, the expected concentrations of metals at the point of discharge are extremely low and are all below their respective IMZMs.

The BIOSCREEN modeling exercise demonstrated that despite the use of extremely conservative assumptions, it is highly unlikely that aqueous phase metals from the shallow saturated zone will reach the Cuyahoga River at concentrations exceeding the IMZMs,(the appropriate standard for comparison at the point of discharge), despite the use of extremely conservative assumptions. Therefore, it was concluded that the exposure pathway consisting of lateral migration of groundwater that may discharge to the Cuyahoga River is incomplete.

Qualitative Ecological Risk Assessment

Based on all direct and indirect observations of flora (plants) and fauna (animals) along the riverbank and top of the riverbank areas, several potentially complete or complete ecological exposure pathways were identified:

Significant Potentially Complete or Complete Exposure Pathways

> *Birds ingesting fallen seed or fruits and incidental soil:* Cardinals were observed feeding or ingesting grit on ground in the top of the riverbank area.

Birds ingesting grit: Although not directly observed, this is a common bird behavior and is considered potentially complete.

Birds ingesting seeds or fruits of herbaceous plants while perched: Herbaceous plant species may uptake and bioconcentrate metals from surficial soil. Because herbaceous plants are rooted in surface soils, this is a potentially significant exposure pathway.

Insignificant Potentially Complete or Complete Exposure Pathways

Birds ingesting soil invertebrates and incidental soil: No soil invertebrates were observed and soil is poor in organic matter, but omnivorous birds were observed in Study Area feeding on the ground surface.

Negligible Potentially Complete or Complete Exposure Pathways

Mammals ingesting bark or leaves: Beaver-damaged trees were observed on the riverbank and deer tracks were observed at the base of the riverbank. Because the riverbank's woody plants are rooted well below the surface soils, they are unlikely to bioconcentrate COCs from surface soils.

Birds ingesting seeds or fruits of woody plants while perched: Both grapes and herbivorous birds (e.g., mourning dove, tree sparrow) occur on the riverbank. Because the riverbank's woody plant species are rooted well below the surface soils, they are unlikely to bioconcentrate COCs from surface soils.

Burrowing mammals or reptiles, incidental ingestion of soil: No burrows or burrowing animals were observed on the site.

Birds ingesting invertebrates in standing dead trees: Flickers were observed feeding on dead trees. Because the riverbank's woody plants are rooted well below the surface soils, they are unlikely to bioaccumulate COCs from surface soils.

The results of the wildlife survey and soil sampling suggest that significant and complete pathways do exist from riverbank surface soils to birds. Furthermore, the elevated levels of COCs observed in the surface soils suggest that a quantitative ecological risk assessment would reveal significant risk to ecological receptors.

The results suggest that actions should be taken to reduce the risk of exposure of birds to surface soil COCs. The primary risk to wildlife identified by this study is from birds feeding on seeds or berries of herbaceous plants either attached to the plant or lying on the ground and consequently the incidental ingestion of soil, or intentional ingestion of grit with high levels of copper, lead, tin and/or zinc.

5.0 CORRECTIVE MEASURES STUDY

The site-specific HHRA and qualitative ERA indicated the need for a CMS for SWMU #11. Based on site observations, the data for the COCs present in the riverbank soils, and the identification of significant complete pathways to ecological receptors, the U.S. EPA and RRI have identified the following goals for the Corrective Measures Plan:

1. To minimize or eliminate the risk of COCs to ecological receptors (birds);
2. To minimize the creation of additional risks to human health or the environment as a result of remedial activities; and
3. To aesthetically enhance the riverbank and top of the riverbank area.

Analysis of Alternatives for Ecological Risk Minimization

In order to accomplish the goals of the Corrective Measures Plan for minimizing ecological risk, three alternative remediation strategies were evaluated.

1. *Remove vegetation and install impenetrable physical barrier.* All vegetation in the Study Area (riverbank and top of the riverbank area) would be removed, and the riverbank would be armored with an impenetrable physical barrier such as rip-rap. The Study Area would then be maintained free of vegetation using manual and chemical maintenance.

The principal advantage of this alternative would be to eliminate future exposure with a physical barrier interposed between the potential ecological receptors and the contaminated substrate.

The disadvantage of this approach is that existing riverbank habitat would be completely removed. The natural vegetation associated with the habitat provides a natural, aesthetic screen between the River Recycling facility and the multi-use trail being developed by the Cleveland MetroParks on the opposite bank of the river.

2. *Remove soils and install physical barrier.* Surface soils in the riverbank and top of the riverbank area would be physically removed and disposed of in a manner appropriate for the COCs they contain. Some sort of physical barrier (e.g., concrete, packed clay, riprap) would then be installed on the riverbank to eliminate contact of ecological receptors with contaminated subsurface soils. Placement of a thick cap of clean soil over the riverbank was considered and rejected, as a single high flow in the river before vegetation was established would likely destroy the cap.

This alternative would eliminate most future risks to ecological receptors by removing all natural habitat features and placing an impenetrable physical barrier. The disadvantages of this alternative are the removal of riverbank habitat, the likely short-term release of sediments and contaminants to the Cuyahoga River and the elimination of the natural vegetation which screens the River Recycling facility

from view along the multi-use trail being developed by the Cleveland MetroParks on the opposite bank of the river.

3. ***Risk minimization & ecological enhancement.*** Steps would be taken to minimize ecological risk by minimizing or eliminating the transfer of surface soil COCs through identified significant and complete pathways to ecological receptors. Specifically, this Alternative will minimize ground feeding by birds and birds feeding on herbaceous riverbank vegetation. This would be accomplished while simultaneously enhancing wildlife habitat by maximizing perching and refuge for transient birds, and by providing aesthetic improvements for the Cleveland MetroParks multi-use trail users.

Implementation of this Alternative would involve taking steps to make bird feeding on the ground or on herbaceous vegetation much less likely. This would be accomplished by removing herbaceous vegetation and managing the riverbank for maximum tree canopy cover such that shade-intolerant herbaceous plants would be uncommon. Woody tree and shrub species typical of the Ohio floodplain forests that provide important bird food would be protected where they occur on the riverbank and planted to increase their numbers. These species include hackberry, sycamore, black cherry, box elder and silver maple. This would enhance perching/refuge and perched feeding opportunities for birds while shading out and thus discouraging herbaceous shade-intolerant vegetation that could draw birds to feed on the ground. Established and freshly planted trees would be protected with appropriate armoring to discourage beaver and other mammalian activity.

A low berm would be constructed along the top of the riverbank to reduce the possibility that contaminated soils from the top of the riverbank area could be eroded and deposited along the riverbank. The top of the riverbank area would be covered with a geotextile to discourage plant root penetration, covered with a ½ -meter thick layer of clean topsoil, and then planted and maintained. Areas of native prairie plant would be established within the top of the riverbank area, and the remainder of the top of thr riverbank area would be planted with turf grasses and maintained as a lawn. The lawn area would be mowed and maintained to exclude broad-leaf plants, while the native prairie plant areas would be mowed annually in the fall to discourage establishment of woody species.

These actions would isolate the top of the riverbank area from ecological receptors and halt the transport of potentially contaminated soil through runoff from the top of riverbank area. In addition, the conversion of the top of riverbank area to an attractive ground feeding area would tend to draw ground-feeding bird species away from the riverbank to feed. Finally, the native prairie planting areas would provide an effective and aesthetic screen both for those viewing the area from the Metropark land on the opposite bank of the river, and for employees using the picnic area.

The advantages of this alternative are that it would preserve and enhance the riverbank plant community and the riparian corridor with its associated wildlife habitat; and provide aesthetic screening functions. It would also provide an attractive and safe outdoor break area for RRI employees. In addition, this

alternative would not involve potential short-term contaminant releases as a result of excavating subsurface fill material.

A disadvantage of this alternative is that significant and complete ecological risk pathways would be minimized, but not completely eliminated.

6.0 SCOPE OF CORRECTIVE ACTION

Recommended Plan and Implementation

River Recycling Industries presented the three Alternatives to the Community Advisory Group (CAG) on December 4, 2001. Alternative 3 (Risk Minimization and Ecological Enhancement) was the alternative recommended by River Recycling Industries and selected by the CAG. Alternative 3 was also reviewed by the Cleveland Metroparks for consistency with the Metropark goals for the multiuse pathway. The U.S. EPA agrees that this remedy meets the goals of the CMS as described above. The Risk Minimization and Ecological Enhancement Plan is detailed in Figure 3.

This remedy will be implemented according to the following plan:

Activities along the Riverbank Area

- Large pieces of scrap metal projecting from the riverbank will be removed, to the extent that this is possible without excessively disturbing riverbank soils.

- Herbaceous plants with value as bird food including but not limited to ragweed, thistle, poison ivy, smartweeds, staghorn sumac, grasses, and sedges, will be removed.

- The bases of established woody species will be armored to protect them from beaver damage, especially the preferred poplar and willow species.

- In areas of incomplete tree canopy cover, seedlings of desirable native tree species including black cherry, hackberry, silver maple, box elder, and sycamore will be planted. The available soil is limited on the riverbank, precluding the planting of larger burlap-balled saplings. Instead, bare-root seedlings will be planted wherever a small diameter plug of sufficient depth can be removed. Due to the relatively low survival rate of bare-root stock, replanting may have to be done at intervals until the new woody vegetation is established.

Activities on the Top of the Riverbank Area

- A ½ meter-tall berm of packed clay will be constructed along the top of the riverbank.

• An appropriate geotextile will be placed over the existing surface. The purpose of the geotextile is to act as a barrier to root growth such that plant roots do not penetrate the lagoon fill material.

• Clean topsoil fill will be placed to a depth of a ½ meter over the geotextile fabric, across the entire top of the riverbank area.

• Beds for native prairie plant areas will be prepared within the top of the riverbank area as shown in Figure 3. The total area of the native prairie plant areas is 0.21 acres. The areas will be delimited with a plastic landscaping border to ensure that areas of lawn and native plantings can be distinguished and properly treated during establishment.

The beds will be prepared for sowing and plugging. Any existing vegetation in the native prairie plant areas will be physically removed or killed with Roundup. The native prairie plant areas will be surface tilled to a depth of two to four inches. The areas will be sown with a high-quality dry prairie seed mixture (e.g., mixes available from JF New Native Plant Nursery, Indiana) at an overall seeding rate of about 42 pounds per acre. The seed mix will contain a high proportion (~70%) of annual cover species such as seed oats and wild rye) that will facilitate establishment of the native species and then die out. The seed mix will consist of approximately 16% native grasses and 12% native forbs by weight.

After seeding, the native prairie plant areas will be covered with a 1" thick layer of crimped straw mulch.

After sowing and mulching of the seed bed, the native prairie plant areas will be planted with plugs of native prairie grasses and forbs. Planting plugs of native plants with a tall growth form will allow rapid establishment of an effective visual screen and establish attractive colors within one year of planting. The plugs will contain mycorrhizal inoculum crucial for the establishment of these species. Plugs of the native grass species big bluestem (Andropogon gerardii), little bluestem (A. scoparius), side-oats grama (Bouteloua curtipendula), and Indian grass (Sorghastrum nutans) will be planted using uniform spacing at a density of 4000 plugs/acre. Plugs of the native forbs compass plant (Silphium laciniatum), prairie dock (S. terebinthinaceum), brown-eyed susan (Rudbeckia triloba), purple coneflower (Echinacea pallida) and downy sunflower (Helianthus mollis) will be planted using uniform spacing at a density of 2000 plugs/acre.

During the first year while native plants are germinating and being established, no weeds will be pulled from the native prairie plant areas as native plant seeds may be pulled up with the roots. During the first year, the sown and plugged native prairie plant areas will be watered with the equivalent of 1" per week of water for the first six weeks after planting either by rainfall or irrigation.

• The remaining top of the riverbank area will be seeded with a mixture of annual and perennial upland turf grasses including Kentucky blue grass, tall fescues and annual rye, mulch and fertilize. These areas will be maintained as a lawn.

Long-Term Maintenance and Monitoring

River Recycling will perform long-term maintenance to prevent re-establishment of herbaceous cover on riverbank, and establish and maintain a closed canopy of woody plants. Establishing a closed canopy of woody vegetation along the entire riverbank area will involve yearly inspections for approximately five years to identify where the planting of bare-root seedlings have failed, and require replanting additional seedlings. Prevention of re-establishment of herbaceous plant cover could be accomplished with the application of a short-duration systemic broadleaf herbicide approved for application on or near water, such as Rodeo ® (n-phosphonomethyl-glycine, 53.5%). This may be necessary if initial efforts at physical removal of herbaceous vegetation are unsuccessful.

River Recycling will monitor the establishment and growth of woody plant species on the riverbank. Seedlings of woody plant species will be re-planted as necessary. River Recycling will maintain the top of the riverbank area outside the native planting areas as a lawn, and will not permit establishment of broadleaf herbaceous or woody species in the lawn. As prescribed burning is not practicable or safe at the site, River Recycling will mow the native planting areas in late fall each year for the first three years, then every third year thereafter.

Summary

This project utilized a qualitative ecological risk assessment based on detailed wildlife survey data to identify remediation alternatives for minimizing or eliminating ecological risks to wildlife. An analysis of alternatives was conducted with the input of a Community Advisory Group. The selected alternative will minimize or remove risks to wildlife while accomplishing other identified goals of the Performance Based Corrective Action, including aesthetic enhancement of the riverbank area.

7.0 PUBLIC PARTICIPATION

The U.S. EPA is soliciting community input on the proposed remedy and all alternative remedies for the River Recycling Industries facility. The U.S. EPA has scheduled a public comment period of 45 days from **February 6, 2004** to **March 23, 2004** to encourage public participation in the remedy selection process. During the public comment period, the U.S. EPA will accept written comments on the proposed remedy. In response to public requests or at the discretion of U.S. EPA, a public hearing may be held to clarify one or more issues concerning this Statement of Basis. A request for a public hearing must be made in writing and must state the nature of the issue(s) to be raised at the hearing. Written request for a public hearing should be sent to the U.S. EPA's address listed below within 45 days of public notice.

The administrative record, which contains documents relevant to the proposed remedy, is available at the following locations:

Cleveland Public Library, Brooklyn Branch
3706 Pearl Road
Cleveland, Ohio 44109

and

U.S. Environmental Protection Agency Region 5
Waste, Pesticides, and Toxics Division
RCRA Records Center
77 West Jackson Boulevard, 7th Floor
Chicago, IL 60604

After U.S. EPA consideration of all public comments received, the comments will be summarized and responses will be provided in a response to comments document. The response to comments document will be drafted at the conclusion of the public comment period and will be incorporated into the administrative record. The public is encouraged to send written comments to U.S. EPA and to request further information.

To submit written comments or obtain further information, please contact the following U.S. EPA representative:

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Telephone No.: (312) 886-5909
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GLOSSARY

Administrative Record - A collection of all documents that the U.S. Environmental Protection Agency (U.S. EPA) considers when selecting corrective measures for a Resource Conservation and Recovery Act (RCRA) facility.

Aquifer - Bedrock or unconsolidated material that is saturated and sufficiently permeable to transmit groundwater to wells or springs.

Bedrock - The solid rock that underlies gravel, soil, or other unconsolidated surficial material.

Corrective Measures Study (CMS) - An evaluation of alternatives for cleanup of a facility contaminated with hazardous waste or hazardous constituents.

Ecological Cover - A cover intended to reduce risk for ecological receptors that consists of a synthetic root penetration barrier overlain by 12 inches of clean soil and native vegetation.

Facility - All contiguous land and structures, other appurtenances, and improvements at a site under a given owner's or operator's control. The facility includes any solid or hazardous waste management areas.

Groundwater - Water found beneath the earth's surface in a saturated zone. Groundwater fills pore spaces between materials such as sand, soil, and gravel as well as fractures/cracks in bedrock.

Hazardous Constituents - Constituents listed in Appendix VIII of 40 *Code of Federal Regulations* (CFR) Part 261 and in Appendix IX of 40 CFR Part 264.

Hazardous Waste - Waste as defined in 40 CFR Section 261.3.

Hazardous Waste Management Unit - A unit in which hazardous waste is disposed of, treated, or stored and which requires a RCRA Part A or Part B permit.

Metals - Chemical substances of mineral rather than organic origin (for example, barium).

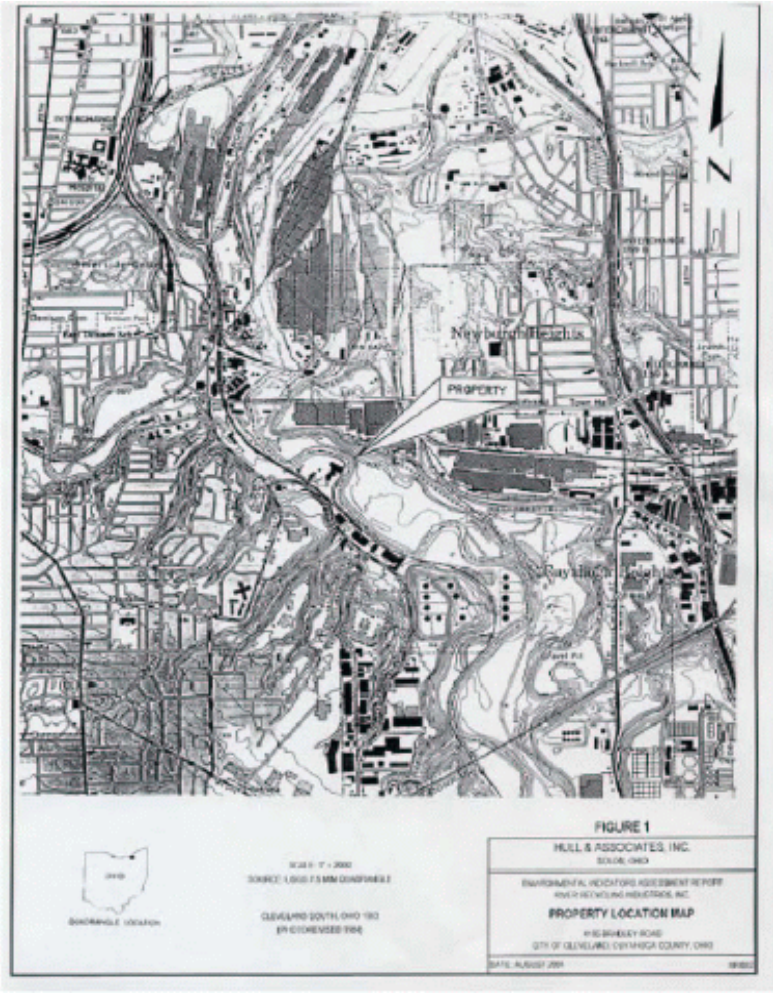
RCRA - Federal law authorizing the U.S. EPA to regulate the treatment, storage, and/or disposal of hazardous waste. The law includes corrective action provisions that authorize the federal government to respond directly to releases of hazardous waste or constituents that may pose a health risk human health or the environment.

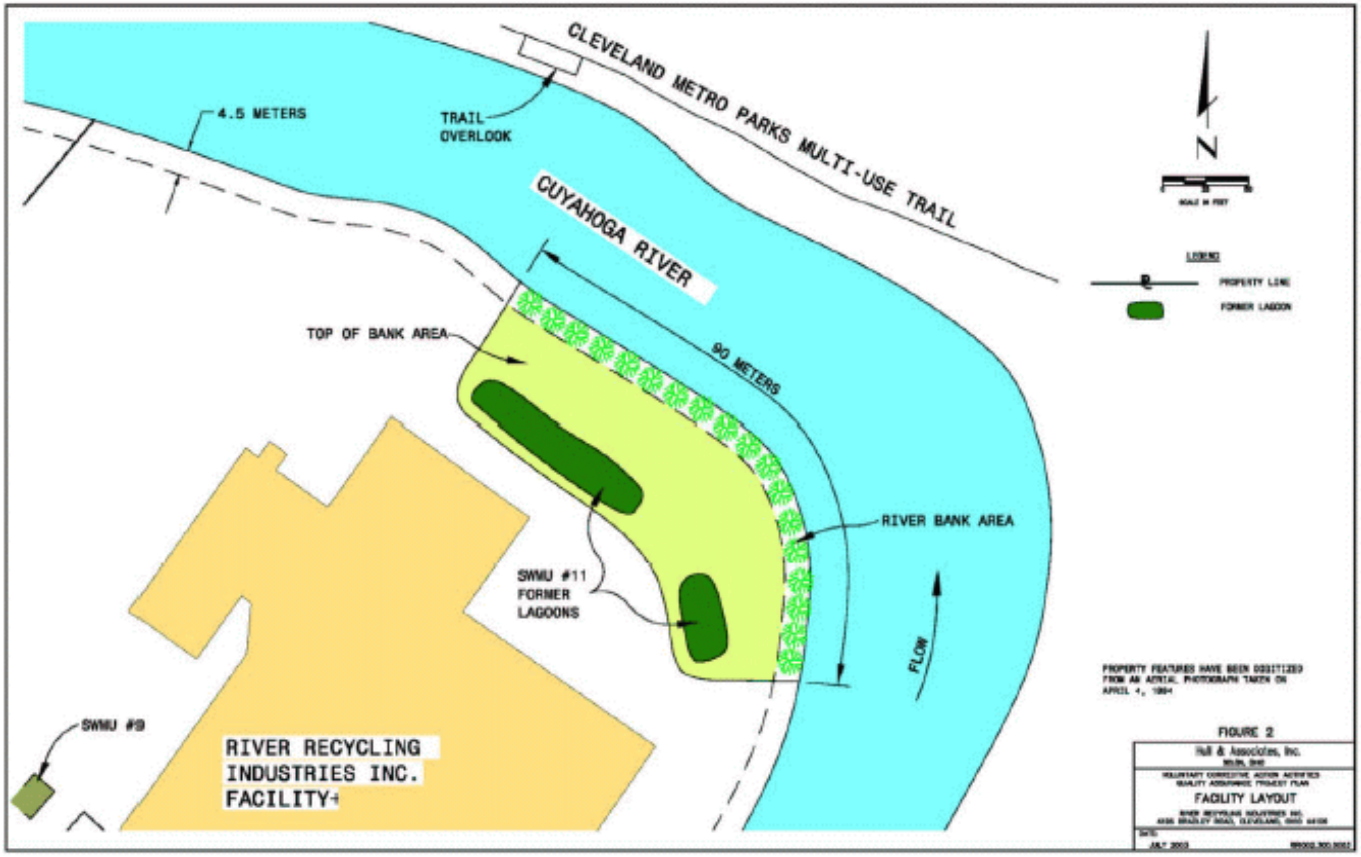
RCRA Facility Investigation (RFI) - An investigation to determine the nature and extent of contamination at a facility and the problems that the contamination may cause. The RFI is performed prior to a CMS, which identifies and analyzes cleanup alternatives for the facility.

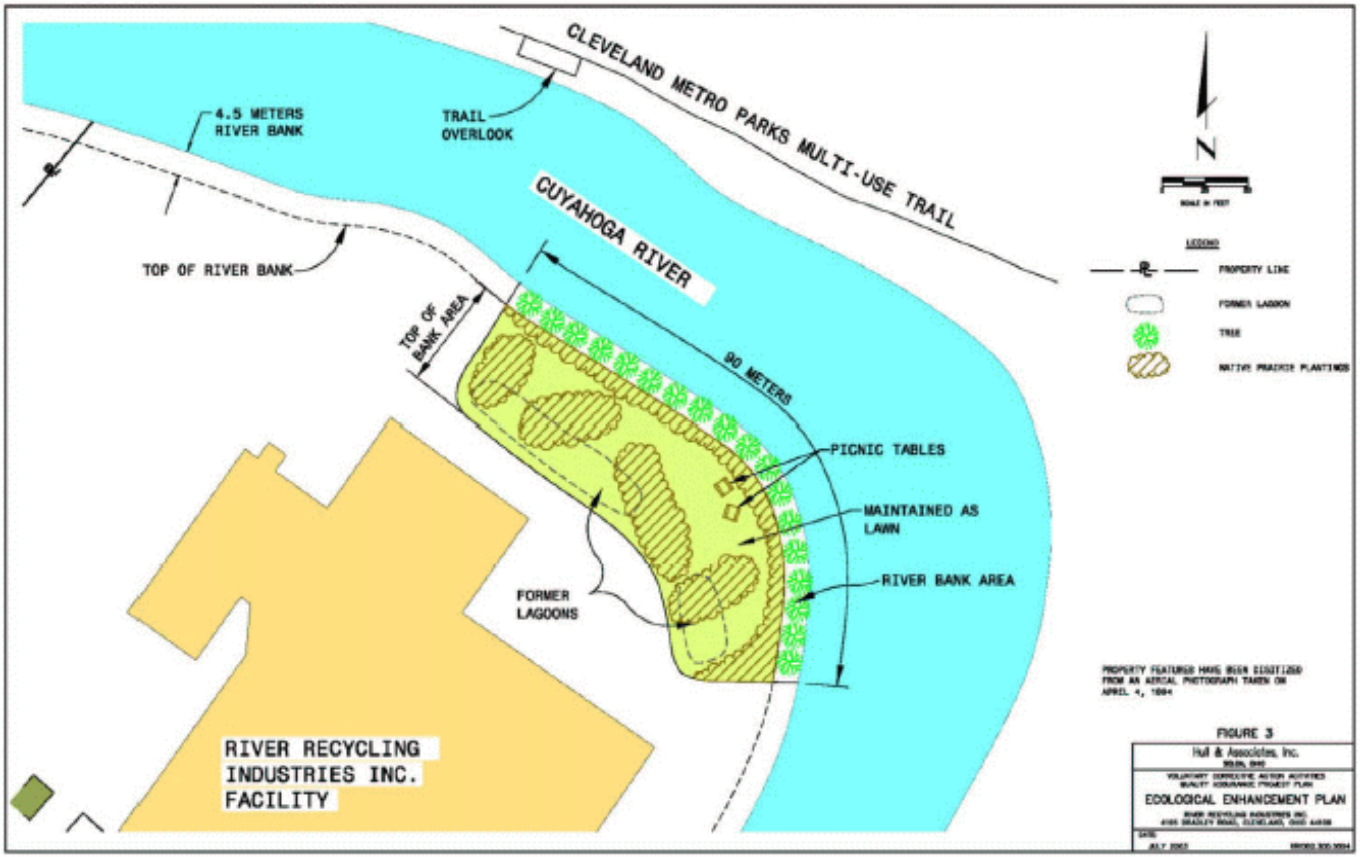
Risk Assessment - An evaluation of existing conditions at a facility with respect to protection of human health, the environment, or both. This evaluation estimates, either qualitatively or quantitatively, the potential for adverse human health or ecological effects associated with contamination at a facility identified during the RFI. Examples of risk assessments include the Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA).

Solid Waste Management Unit (SWMU) - Any unit at a facility that contains or has contained solid or hazardous waste and from which hazardous waste or hazardous constituents might migrate regardless of whether the unit was intended for management of solid or hazardous waste. A SWMU may include areas at a facility that have become contaminated as a result of routine releases of hazardous waste or hazardous constituents. Examples of SWMUs include landfills, surface impoundments, waste piles, land treatment units, incinerators, injection wells, tanks (including 90-day accumulation tanks), container storage areas, transfer stations, and waste recycling operations.

Statement of Basis (SOB) - A public document that explains the corrective measures proposed by the U.S. EPA to remediate contamination at a facility subject to RCRA corrective action. The SOB is based on technical information generated during the RFI and CMS.


N
PROPERTY
FIGURE 1
HULL & ASSOCIATES, INC.
PROPERTY LOCATION MAP


CLEVELAND METRO PARKS MULTI-USE TRAIL
4.5 METERS
TRAIL OVERLOOK
CUYAHOGA RIVER
TOP OF BANK AREA
90 METERS
RIVER BANK AREA
SWMU #11
FORMER
LAGOONS
FLOW
SWMU #9
RIVER RECYCLING
INDUSTRIES INC.
FACILITY
N
LEGEND
PROPERTY LINE
FORMER LAGOON
PROPERTY FEATURES HAVE BEEN DIGITIZED
FROM AN AERIAL PHOTOGRAPH TAKEN ON
APRIL 4, 1994
FIGURE 2
Hull & Associates, Inc.
FACILITY LAYOUT
JULY 2003


CLEVELAND METRO PARKS MULTI-USE TRAIL
4.5 METERS
RIVER BANK
TRAIL
OVERLOOK
CUYAHOGA RIVER
TOP OF RIVER BANK
TOP OF
BANK AREA
90 METERS
PICNIC TABLES
MAINTAINED AS
LAWN
RIVER BANK AREA
FORMER
LAGOONS
RIVER RECYCLING
INDUSTRIES INC.
FACILITY
N
LEGEND
PROPERTY LINE
FORMER LAGOON
TREE
NATIVE PRAIRIE PLANTINGS
PROPERTY FEATURES HAVE BEEN DIGITIZED
FROM AN AERIAL PHOTOGRAPH TAKEN ON
APRIL 4, 1994
FIGURE 3
Hull & Associates, Inc.
ECOLOGICAL ENHANCEMENT PLAN
JULY 2003